What is claimed is:

1.   An image processing apparatus, comprising:

an inputting device inputting a multilevel image;

5   a stroke extracting device extracting a plurality

of stroke regions from the multilevel image, and

generating a binary image of the plurality of stroke

regions;

a feature extracting device extracting a feature

10   amount based on an attribute of a different pixel included

in a neighboring region of a target pixel by using each

pixel in each of the plurality of stroke regions as the

target pixel; and

a separating device separating pixels belonging

15   to a target stroke region from the binary image of the

plurality of stroke regions by using the extracted

feature amount of each pixel, and generating a binary

image of the target stroke region.

20   2.   The image processing apparatus according to

claim 1, wherein

said stroke extracting device generates the binary

image of the plurality of stroke regions by using at

least one of a global binarization process using a single

25   threshold value and a local binarization process using

a different threshold value for each pixel within an image.

3. The image processing apparatus according to claim 1, wherein

said feature extracting device extracts, as feature amounts, information indicating a thickness of a stroke region in the neighboring region, and information indicating a smoothed gray level of the stroke region in the neighboring region.

4. The image processing apparatus according to claim 1, wherein

said feature extracting device extracts, as the feature amount, information indicating a thickness of a stroke region in the neighboring region.

5. The information processing apparatus according to claim 4, wherein

said feature extracting device extracts, as the information indicating the thickness, information indicating a length in a shortest direction among a length of the stroke region in the neighboring region in a vertical direction, a length in a horizontal direction, and a length in an oblique direction.

6.   The image processing apparatus according to claim 4, wherein

said feature extracting device extracts, as the information indicating the thickness, information indicating a length of a cutting line that passes through the target pixel and cuts the stroke region in the neighboring region in a direction perpendicular to the stroke region.

7.   The image processing apparatus according to claim 6, wherein

said feature extracting device obtains a difference between a graylevel of each pixel in the cutting line and a graylevel of a background, and extracts, as the information indicating the thickness, a value obtained by dividing a sum of graylevel differences by a maximum graylevel difference.

8.   The image processing apparatus according to claim 1, wherein

said feature extracting device extracts, as the feature amount, information indicating a smoothed graylevel of a stroke region in the neighboring region.

9. The image processing apparatus according to claim 8, wherein

said feature extracting device extracts, as the information indicating the smoothed thickness, a graylevel value closest to black among graylevel values of pixels in a direction that passes through the target pixel and is perpendicular to the stroke region in the neighboring region.

10. The image processing apparatus according to claim 8, wherein

said feature extracting device extracts, as the information indicating the smoothed thickness, an average of graylevel values of pixels in a direction that passes through the target pixel and is perpendicular to the stroke region in the neighboring region.

11. The image processing apparatus according to claim 1, wherein

said separating device estimates a range, in which feature amounts of pixels in a stroke region to be deleted are distributed, based on information of a given ruled line frame, and separates the pixels belonging to the target stroke region by deleting pixels corresponding to the estimated range from the binary image of the

plurality of stroke regions.

12. The image processing apparatus according to claim 1, wherein

5   said separating device divides a distribution of feature amounts of pixels included in the binary image of the plurality of stroke regions into a plurality of distributions with clustering, and separates the pixels belonging to the target stroke region.

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13. A storage medium on which is recorded a program for a computer, the program causing the computer to perform:

extracting a plurality of stroke regions from a

15   multilevel image, and generating a binary image of the plurality of stroke regions;

extracting a feature amount based on an attribute of a different pixel included in a neighboring region of a target pixel by using each pixel in each of the

20   plurality of stroke regions as the target pixel; and

separating pixels belonging to the target stroke region from the binary image of the plurality of stroke regions by using the extracted feature amount of each pixel, and generating a binary image of the target stroke

25   region.

14. A propagation signal for propagating a program to a computer, the program causing the computer to perform:

5   extracting a plurality of stroke regions from a multilevel image, and generating a binary image of the plurality of stroke regions;

       extracting a feature amount based on an attribute of a different pixel included in a neighboring region

10   of a target pixel by using each pixel in each of the plurality of stroke regions as the target pixel; and

       separating pixels belonging to a target stroke region from the binary image of the plurality of stroke regions by using the extracted feature amount of each

15   pixel, and generating a binary image of the target stroke region.

15. An image processing method, comprising:

       extracting a plurality of stroke regions from a

20   multilevel image, and generating a binary image of the plurality of stroke regions;

       extracting a feature amount based on an attribute of a different pixel included in a neighboring region of a target pixel by using each pixel in each of the

25   plurality of stroke regions as the target pixel; and

separating pixels belonging to a target stroke region from the binary image of the plurality of stroke regions by using the extracted feature amount of each pixel, and generating a binary image of the target stroke

5   region.

16.   An image processing apparatus, comprising:

inputting means for inputting a multilevel image;

stroke extracting means for extracting a plurality

10   of stroke regions from the multilevel image, and for generating a binary image of the plurality of stroke regions;

feature extracting means for extracting a feature amount based on an attribute of a different pixel included

15   in a neighboring region of a target pixel by using each pixel in each of the plurality of stroke regions as the target pixel; and

separating means for separating pixels belonging to a target stroke region from the binary image of the

20   plurality of stroke regions by using the extracted feature amount of each pixel, and for generating a binary image of the target stroke region.